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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FISCHER, JUSTIN R

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/086,685

Applicant(s)

ANDERSON ET AL.

Examiner

Justin R Fischer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 34-47 and 57 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33, 48-56 and 58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1,2,3.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of a filament winding apparatus (claims 1-33, 48-56, and 58) in the reply filed on May 26, 2004 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-8, 10, 48, 51-54, and 58 are rejected under 35 U.S.C. 102(e) as being anticipated by Benson (US 6,096,164). As best depicted in Figure 1, Benson is directed to a filament winding apparatus comprising (i) a spool section or cabinet 19 comprising at least one fiber bundle spool 18 and a winding head 9 comprising a spreading assembly 35, (ii) a transport or carriage 3 designed to longitudinally move said fiber spool section, and (iii) a controller or computerized system for applying said fiber bundle (Column 3, Lines 55-60).

Regarding claim 2, the apparatus of Benson contains a mandrel 10 supported by a headstock 1 and a tailstock 2.

As to claim 3, Benson describes the inclusion of a series of redirects or idler rods to control the tension (Column 5, Lines 40-50).

With respect to claim 4, the arm of Benson supports the spool section and is seen to constitute an articulator.

Regarding claim 5, Benson includes a winding head or delivery head 9.

With respect to claim 6, the spreading assembly is defined by a plurality of spreader bars or rods 24-26.

As to claim 7, Figure 7 depicts the winding head as being enclosed within a frame. The figure further depicts a roller at the base of the frame and the outlet of the winding head is seen to constitute a winding eye.

Regarding claim 8, the fiber bundles pass through a plurality of spreading bars and rollers before being arranged on the mandrel in a side-by-side manner.

As to claim 10, Benson states that bar 26 can be kept stationary while moving bar 25. It is additionally noted that the fiber bundle passes between rollers 30 and 31, which would be expected to be rotated.

Regarding claims 48 and 58, the headstock and tailstock are seen to represent a first providing component that supports or provides a mandrel and the carriage is seen to constitute a second providing component that provides at least one spool configured to travel along a path parallel to the axis of the mandrel. The fiber bundles are directed through a plurality of rollers and spreading bars, which are seen to constitute a feeding and conveying component. Lastly, as noted above, the winding apparatus of Benson includes a head 9, which is seen to constitute a first applying component.

With respect to claim 51, the apparatus of Benson provides a substantially uniform skin thickness.

As to claims 52-54, Benson states that the winding apparatus is suitable for laying fiber tows on geodesic compound shape forms (Column 2, Lines 65-67). It is noted that the apparatus of Benson is described as having the ability to apply a fiber bundle over an entire mandrel having a geodesic shape form (one can view each half of the mandrel as defining a section). As to claim 54, Benson states that a flat, geodesic, or complex compound shape form is suitable for the inventive apparatus and thus, the apparatus is configured to apply fiber bundles to a mandrel having a geodesic and non-geodesic component.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benson as applied in the previous paragraph and further in view of either one of Meyer (US 6,082,660) or Knight (US 3,874,030). As previously noted, the apparatus of Benson includes a plurality of spreader bars designed to spread and flatten the fiber bundle. While the bars are not depicted as being curved or bent, it is extremely well known in the winding industry to include at least one curved bar in order to promote spreading, as shown for example by Knight (Abstract) and Meyer (Figure 1 and Column 3, Lines 15-30). Thus, it is evident that the benefits of incorporating a curved bar are consistent

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with those desired by Benson and as such, one of ordinary skill in the art at the time of the invention would have found it obvious to form at least one of the spreading bars of Benson as a curved bar, there being no conclusive showing of unexpected results to establish a criticality for the claimed arrangement.

6. Claims 11-18, 20-25, 27, 28-33, 49, 55, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benson as applied in Paragraph 3 above and further in view of either one of Nakamura (US 4,921,557) or Poulsen (US 3,886,029). In describing the fiber bundles (or fiber tows), Benson states that they are formed of pre-impregnated fibers. However, the pre-preg method and the wet fiber lay-up method are extremely well known in the winding industry and are commonly referred to as alternative winding techniques. In the wet lay-up technique, resin is applied to the fiber bundle after it has been delivered from the spool section as opposed to being applied prior to rolling onto the spool. Nakamura and Poulsen evidence the well-known technique in which a resin application system is arranged on the spool carrying carriage, in an analogous manner to the claimed invention. It is further noted that this is consistent with the carriage structure disclosed by Benson, particularly the inclusion of a spool section on a slidable carriage assembly. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a resin application system in the apparatus of Benson.

As to claims 12 and 28, the claimed structure represents a common way of applying resin to a fiber bundle in a winding apparatus. Poulsen provides one

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example of such a structure in which resin is transported (from a supply or container) through a hose or piping system to an outlet nozzle or resin dispenser.

Regarding claims 13 and 29, Benson states that tackiness of tows increases with increased temperature (Column 2, Lines 45-55)- thus, by heating the resin, the tackiness of the tow would be increased as desired.

With respect to claims 14 and 30, Poulsen evidences the well-known use of a metering system when applying resin a winding apparatus (Column 5, Lines 25-35).

Regarding claims 15-18, and 31, Benson states that the winding apparatus is a completely computerized system and one of ordinary skill in the art at the time of the invention would have readily appreciated a design in which the computer (controller) controls each of the components of the winding apparatus.

As to claims 19, 32, and 55, the winding apparatus of Benson is suitable for the application of fiber tows on a plurality of designs having a wide variety of shapes, including concave sides, convex sides, truncated sides, and uneven sides. Thus, one of ordinary skill in the art at the time of the invention would have found it obvious to form a plurality of structures using the apparatus of Benson, including fuselages, it being well-known that fuselages are commonly formed with such an apparatus.

Regarding claims 20, 33, and 56, the apparatus is clearly capable of applying a fiber gauge tow of less than 0.0038 inches.

As to claims 21, 23-25, and 49, Benson in view of either one of Nakamura or Poulsen teach the relevant structural components as set forth above.

With respect to claim 22, the delivery head 9 of Benson includes a wrist 17 that is configured to rotate said winding or delivery head.

Regarding claim 27, as noted above, Benson states that bar 26 can be kept stationary while moving bar 25. It is additionally noted that the fiber bundle passes between rollers 30 and 31, which would be expected to be rotated.

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Benson, Nakamura, and Poulsen as applied in claim 23 above and further in view of either one of Meyer or Knight. As previously noted, the apparatus of Benson includes a plurality of spreader bars designed to spread and flatten the fiber bundle. While the bars are not depicted as being curved or bent, it is extremely well known in the winding industry to include at least one curved bar in order to promote spreading, as shown for example by Knight (Abstract) and Meyer (Figure 1 and Column 3, Lines 15-30). Thus, it is evident that the benefits of incorporating a curved bar are consistent with those desired by Benson and as such, one of ordinary skill in the art at the time of the invention would have found it obvious to form at least one of the spreading bars of Benson as a curved bar, there being no conclusive showing of unexpected results to establish a criticality for the claimed arrangement.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Barr (US 6,112,792), Corbett (US 4,610,402), and Bradley

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(US 3,616,063) are directed to winding apparatus having a spool section disposed on a carriage that is slidable along the longitudinal length of the mandrel.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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August 20, 2004